

CLAIMS

1. A backlight used for a liquid crystal display device comprising:
a bandpass filter that selectively allows blue light having a center
5 wavelength of 400-440 nm, green light having a center wavelength of 520-530 nm
and red light having a center wavelength of 620-640 nm, respectively, to pass
therethrough; and
a light source that emits at least light of the wavelength ranges towards
the bandpass filter.

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2. The backlight according to claim 1, wherein any one of a prism sheet
and a directional optical transmission member, each having a prism structure
capable of increasing the component of light perpendicularly incident from the
light source on the bandpass filter, is disposed between the light source and the
15 bandpass filter.

3. The backlight according to any one of claims 1 and 2, wherein the
bandpass filter is formed by using cholesteric liquid crystal.

20 4. The backlight according to claim 3, wherein the bandpass filter is
formed by laminating together cholesteric liquid crystal layers, which respectively
allow blue light having a center wavelength of 400-440 nm, green light having a
center wavelength of 520-530 nm and red light having a center wavelength of
620-640 nm to pass therethrough, and a reflection polarizer disposed close to the
25 light source.

5. The backlight according to claim 3, wherein the bandpass filter is

formed by having a half wavelength plate held between cholesteric liquid crystal layers that respectively reflect circularly polarized light of the same circular polarization as each other.

5 6. The backlight according to claim 5, wherein the half wavelength plate is a broadband half wavelength plate that corresponds to the visible light range.

7. The backlight according to claim 5, wherein the half wavelength plate is formed by using liquid crystal polymer.

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8. The backlight according to claim 3, wherein the bandpass filter is formed by laminating together cholesteric liquid crystal layers that respectively reflecting circularly polarized light of the opposite circular polarizations.

15 9. The backlight according to any one of claims 5-8, wherein of the cholesteric liquid crystal layers, one cholesteric liquid crystal layer disposed close to the light source reflects circularly polarized light of a wide wavelength range corresponding to the visible light range, while another cholesteric liquid crystal layer allows blue light having a center wavelength of 400-440 nm, green light
20 having a center wavelength of 520-530 nm and red light having a center wavelength of 620-640 nm to pass therethrough.

10. The backlight according to any one of claims 1 and 2, wherein the bandpass filter comprises a multilayer lamination of resin films respectively
25 having different refractive indexes.

11. The backlight according to claim 10, wherein the multilayer

lamination of the resin films is formed through film deposition.

12. The backlight according to claim 10, wherein the multilayer lamination of the resin films is formed through multilayer extrusion and then stretching.

13. The backlight according to claim 12, wherein the multilayer lamination of the resin films is formed through multilayer extrusion and then biaxial stretching.

14. The backlight according to claim 12, wherein the resin films have birefringence anisotropy by being subjected to stretching and orientation, and the multilayer lamination of the resin films are formed through multilayer extrusion and then biaxial stretching.

15. The backlight according to any one of claims 1 and 2, wherein the bandpass filter comprises a multilayer lamination of dielectric films respectively having different refractive indexes.

16. A liquid crystal display device comprising a liquid crystal cell and the backlight according to any one of claims 1-15.

17. The liquid crystal display device according to claim 16, further comprising a diffusing plate disposed between the backlight and the liquid crystal cell.